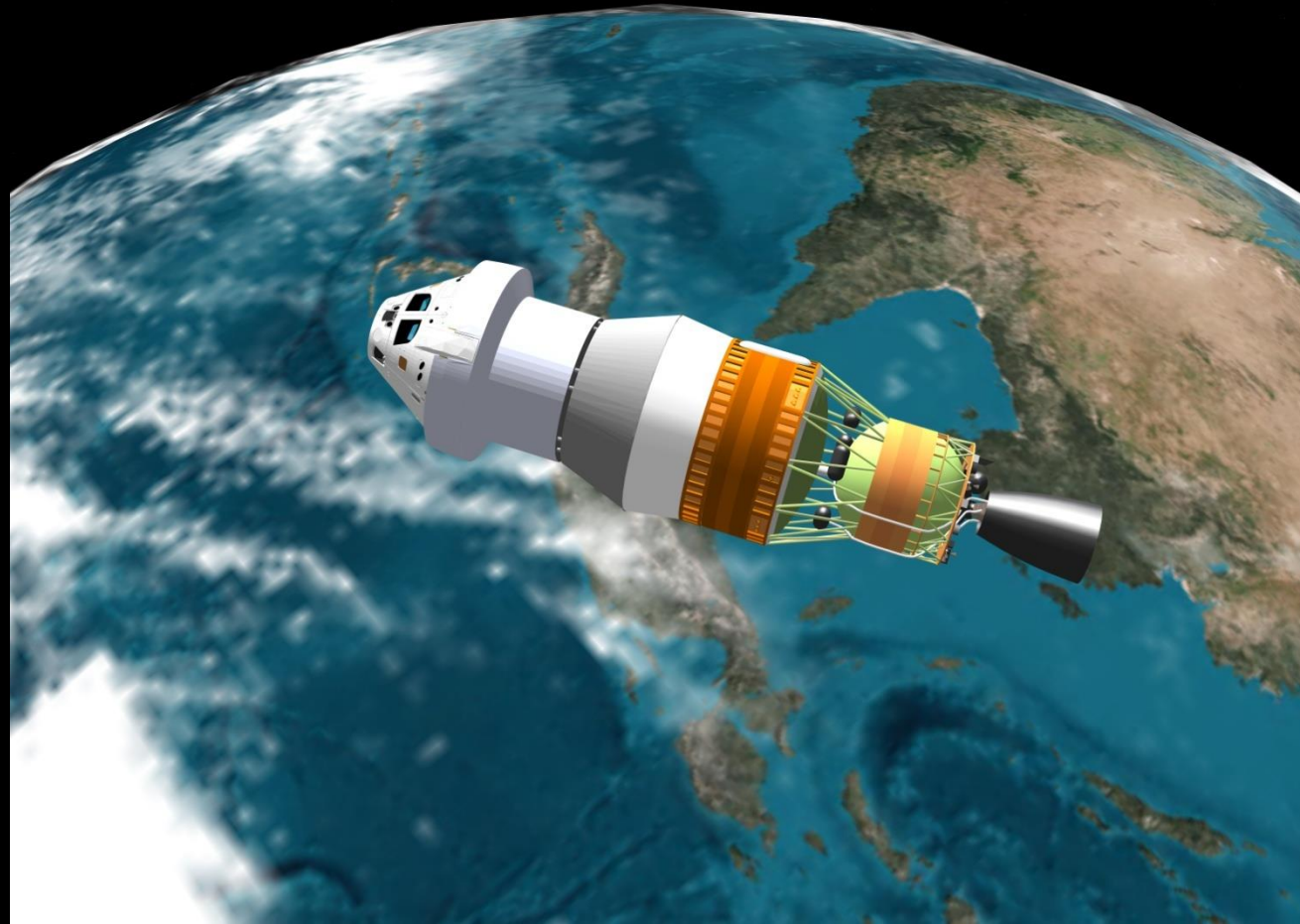




Orion Agile Test & Verification - IEEE Standards Subcommittee Review

Darrel Raines

November 2, 2015



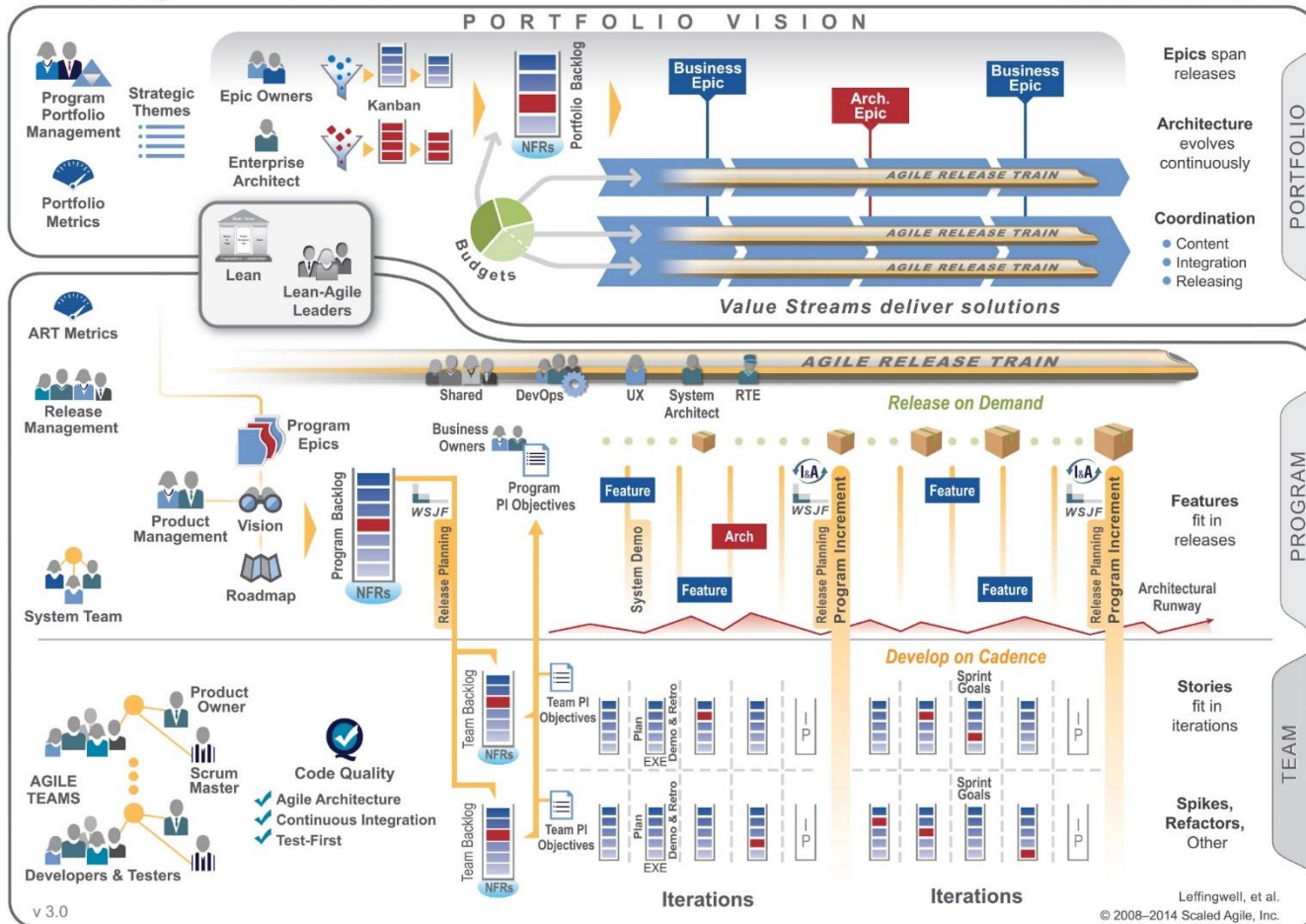


Scaled Agile Framework (SAFe)



Orion Project

Scaled Agile Framework®

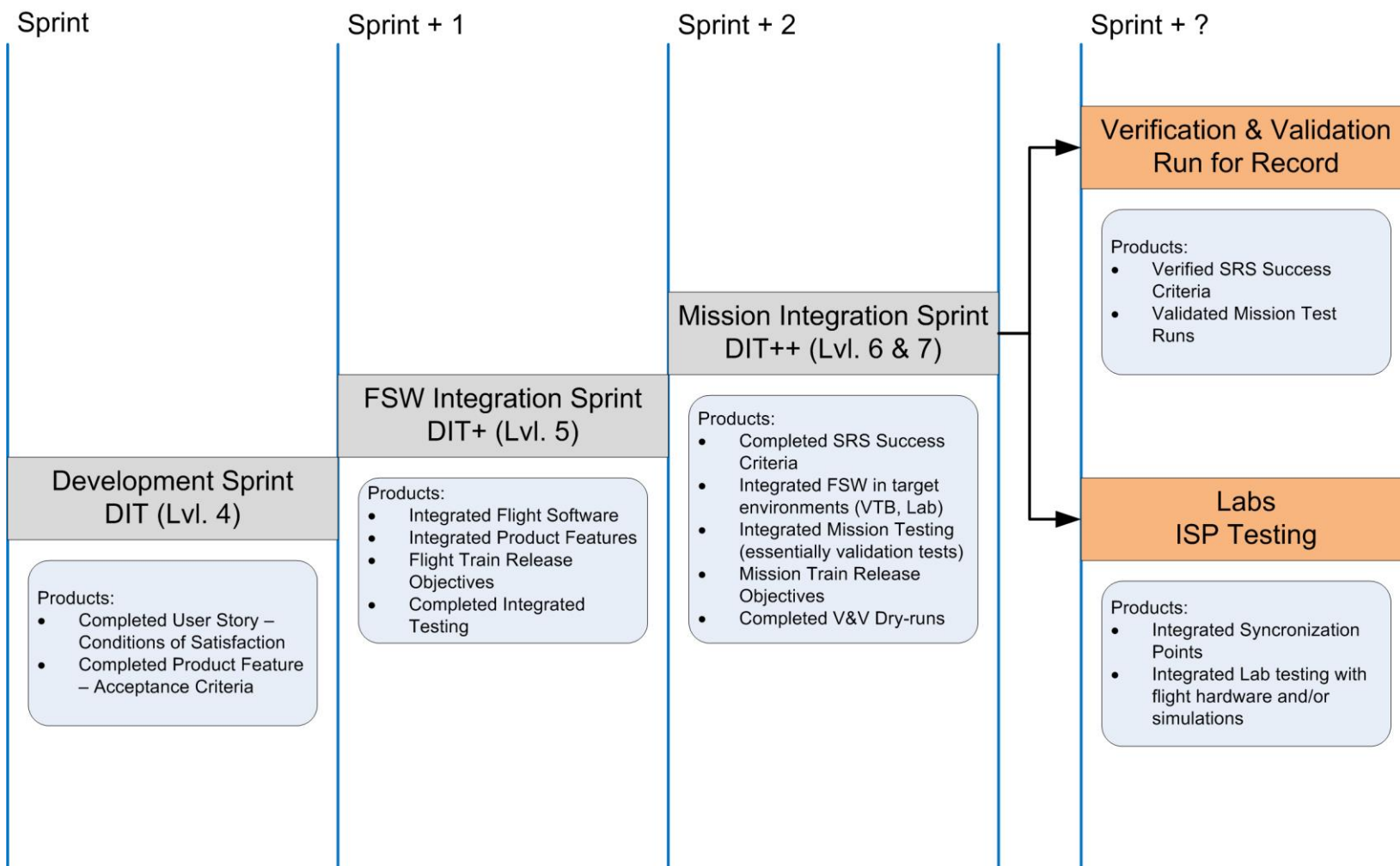




Orion Test and Verification



Orion Project

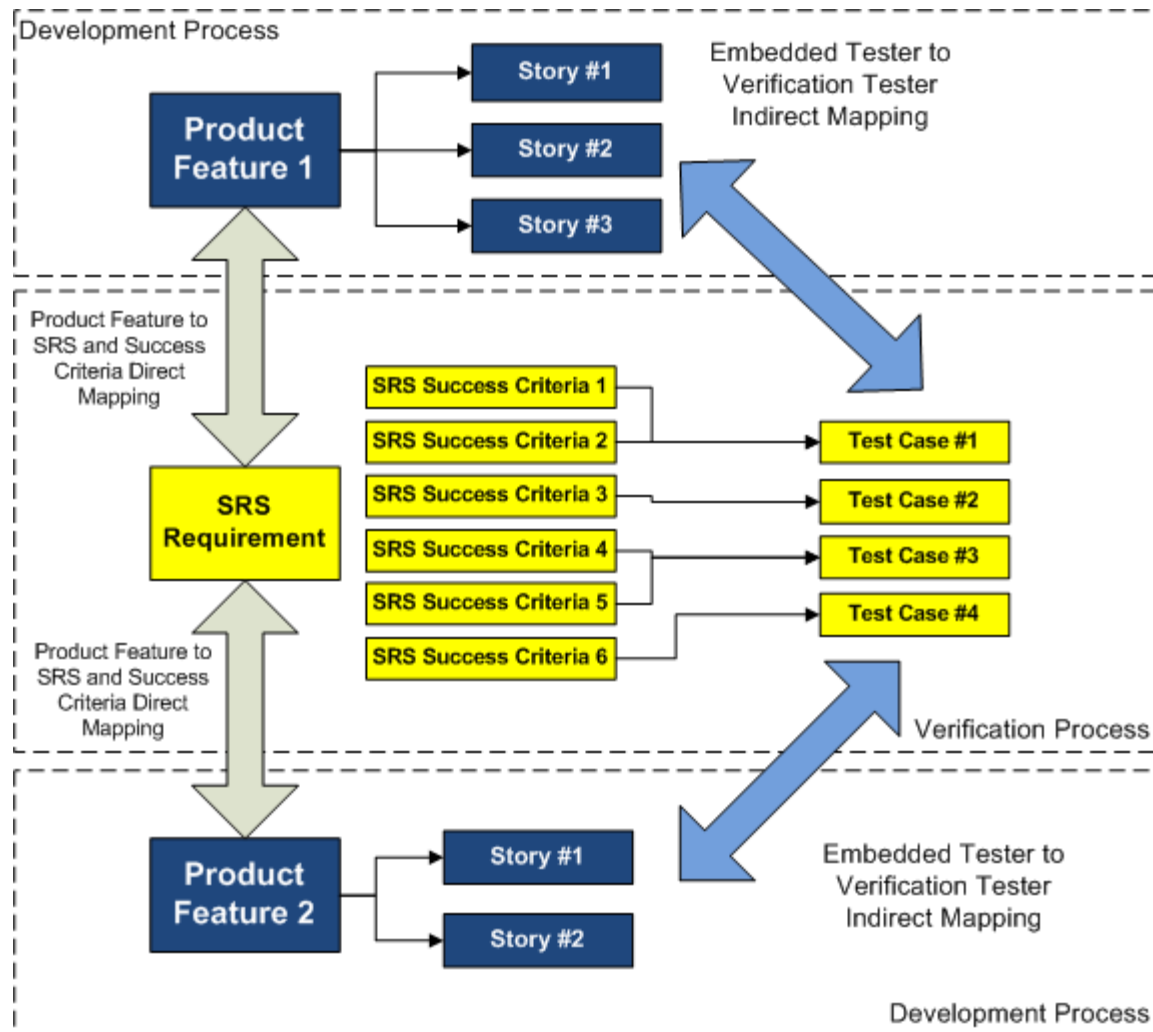




Mapping Product Features to SRSs



Orion Project





Definition of Done



Orion Project

- ◆ **The Definition of Done for User Stories and/or Product Features must contain test artifacts**
 - Coding Standards check
 - Static Analysis
 - Dynamic Analysis (optional)
 - Development Integration Test
 - Assures that the code meets the Conditions of Satisfaction for the User Story
 - Assures that the code meets the Success Criteria for the Product Feature
- ◆ **Lockheed Martin and NASA are using JIRA as a tracking tool for software development on Orion**



Regression Testing



Orion Project

◆ Automation

- Automated tests at all levels will all the engineers to run tests that otherwise they “don’t have time to run”
- Orion has developed an automated test architecture that allows code to be run at the partition level with python scripting
- PLATO won the Software of the Year award at NASA Johnson Space Center
- Adopted by Lockheed Martin to ease the burden of regression testing



Challenges of Agile Testing



Orion Project

- ◆ **When schedule pressure begins to exert forces on the code developers, they respond by complaining about the rigor of the Definition of Done for User Stories/Product Features**
- ◆ **There are multiple platforms that are used for verification of a test case / script**
 - Software only
 - Emulated embedded software with simulations of other systems
 - Emulated embedded software with real hardware/firmware
 - Real embedded software with real hardware/firmware



Challenges of Agile Testing (2)



Orion Project

- ◆ **Software Requirement Specifications (SRS) are not flexible**
 - Agile is geared toward a development environment where the needs of the User are understood and adapted at the Sprint Team level
 - NASA has contracts that are not flexible from the standpoint of requirements
- ◆ **Orion is so large (>300 software developers and testers) that coordination of Sprint Teams, stakeholders, etc. can be difficult**
 - SAFe is supposed to help address that
 - SAFe is relatively new
 - Orion is the largest known program to attempt SAFe